

A BACK-TO-BACK BARRIER-N-N⁺ (bbBNN) DIODE TRIPLER AT 200 GHz

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ABSTRACT

This paper describes the performance of planar back-to-back Barrier-N-N⁺ (bbBNN) devices for mm- and submm wave multiplier application. Efficiency of bbBNN devices has been calculated using a large signal analysis approach. The embedding impedance requirement has also been analyzed. Both series resistance and voltage dependent capacitance of the device were measured with a new measurement technique using vector network analyzer. Results show that bbBNN devices do not have high series resistance like Barrier-Intrinsic-N⁺ (BIN) devices. A tripling efficiency of 2% has been achieved using these planar devices at 200 GHz. Theoretical and experimental analysis shows that planar bbBNN devices are very promising for terahertz and space applications.

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